

Activity: 6.4
Develop Integration Test Plan

Responsibility: Project Team Programmers

Description: The purpose of integration testing is to verify the integrity of a module (a cohesive set of programs) and its interfaces with other modules within the software structure. An integration test plan is developed to incorporate successfully unit-tested modules into the overall software structure and to test each level of integration to isolate errors introduced by newly incorporated modules.

The number of integration levels, the classes of tests to be performed, and the order in which routines and builds are incorporated into the overall software structure are addressed in the Integration Test Plan. The following factors should be considered.

- Are routines to be integrated in a pure top-down manner or should builds be developed to test subfunctions first?
- In what order should major software functions be incorporated?
- Is the scheduling of module coding and testing consistent with the order of integration?
- Is special hardware required to test certain routines?

Integration testing should include tests that validate the following functions.

- Verify each interface between the module and all other modules.
- Access each input message or command processed by the module.
- Check each external file or data record referenced by coding statements in the module.
- Output each message, display, or record generated by the module.

An important consideration during integration test planning is the amount of test software (e.g., drivers, test case generation) that must be developed to adequately test the required functionality. For example, it may be cost-effective to delay testing of a communication function until hardware is available rather than generate test software to simulate communication links.

**Description,
continued:**

Similarly, it may be better to include certain completed modules in the software structure in order to avoid having to develop software drivers. These decisions are made on the basis of cost and risks.

Work Product:

Develop the draft Integration Test Plan that addresses the following activities.

- Define the integration tests at each element level, stating objectives, what is to be tested, and verified. Testing is from the point of view of structure and function.
- Define all aspects of the formal interfaces that must undergo formal integration testing. Review interface requirements to ensure completeness, consistency, and effectiveness.
- Plan for test tools and software that must be developed to adequately test the required functionality.

Review Process:

Conduct a peer review or structured walkthrough to assure that the draft Integration Test Plan is accurate and complete. The Integration Test Plan will be reviewed and revised as needed during the Programming Stage.